Research Division

Tools for Better Transportation Tomorrow

January 2006

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What's HOT

Research Division Employee Awarded National Recognition

One of the Research Project Managers in our Research Division, Blaine Leonard, was recently given a national award by the American Society of Civil Engineers. At the ASCE Annual Conference in Los Angeles, in late October, Blaine was awarded the William H. Wisely American Civil Engineer Award, an annual award given to individuals who have exhibited continuing efforts to better the technical and professional activities of the society. The award specifically cites Blaine's "leadership and perseverance in guiding the governance restructuring initiative", a multi-year plan to radically change the organizational structure of ASCE, and for his service on the ASCE Board of Direction. He is currently serving as a Vice President and on the society's Executive Committee. Blaine was presented the Wisely Award by ASCE President Bill Henry. ASCE is a worldwide organization of civil engineers, established in 1852, with 139,000 members in all sectors of practice and stages of their careers.

UTRAC Projects Move Forward

Back in March, 153 dedicated UDOT employees and industry partners reviewed 80 research proposals, and prioritized 32 projects for potential funding. By late Spring, it had been determined that 25 of these projects could be funded with available Federal and State Research funds. These projects come from every aspect of UDOT's business, from maintenance to traffic operations to structural design. Since that time, the Research Project Managers have worked with UDOT Champions to get these projects underway and completed. Sixteen of these new projects are currently underway. A few examples of the things that are happening with these projects follow:

Construction

Type III Micro Surfacing Used As a Life Extender of Old Concrete Pavement on I-70 Mile Marker 10 +/- In Region Four

Materials & Pavements

None

In The Know

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Dr. Paul Barr, a structural engineering professor at Utah State University, is taking a close look at our concrete mix designs for bridge decks, with the specific intent of identifying factors which could reduce cracking in those decks. Working with Daniel Hsiao, the Research Project Manager, and Todd Jensen, UDOT's chief structural engineer, Dr. Barr will test and monitor new bridge decks on four bridges, and make recommendations for revised mix designs.

Dongre Laboratory Services, experts in asphalt pavements from Fairfax, Virginia, is evaluating the uniformity of asphalt binders, and the effect it has on pavement performance. Tim Biel and Kevin Van Frank, from our Materials Division, and Doug Anderson, the Research Project Manager are coordinating this project, with the end goal of developing an asphalt binder uniformity specification.

Dr. Alan Zundel, from Brigham Young University, is working on a bridge scour project, under the direction of UDOT's Hydraulics Division. Following up on some earlier work, Dr. Zundel is creating guidelines for selecting appropriate shallow flow structures for stream stabilization and scour protection at bridge crossings. Daniel Hsiao is the Research Project Manager on this project.

Dr. David Strayer, at the University of Utah, is continuing some important work with winter maintenance driver training using simulators. In a previous contract, studies indicated that UDOT would save on fuel costs and decrease the risk of accidents if drivers of snow plows and other maintenance equipment were given additional training in the driving simulator. Under the direction of Rich Clarke from Central Maintenance and Research Director Shana Lindsey, Dr. Strayer is customizing the training for specific driver needs and refining the training protocols, making this a more useful tool.

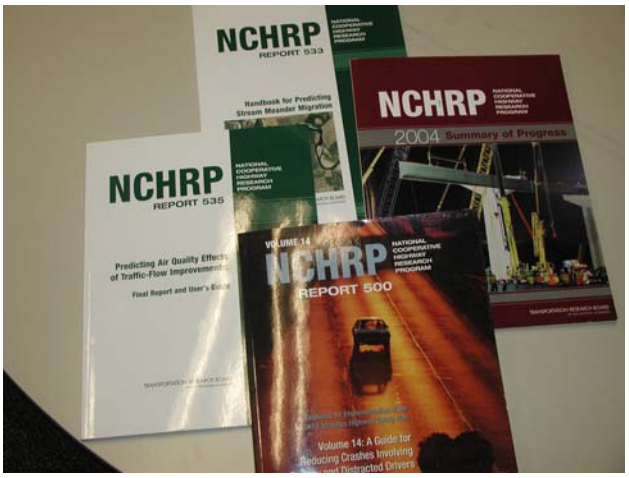
Francis Ashland, a geologist with the Utah Geological Survey, and Dr. Jim Bay, from Utah State University, are applying their expertise to better understand a large landslide on SR-9, east of Zions National Park. This very large landslide, known as Coal Hill, moves frequently, severely distorting the road alignment and grade. With guidance from Leslie Hepler, the UDOT Geologist, and Rick Torgerson, a Project Manager in Region 4, Ashland and Bay are mapping the slide, measuring its movement, and using a new geophysical technique known as Spectral Analysis of Surface Waves to better define the nature of the problem. With this new data, UDOT will be better able to assess possible mitigating measures. Blaine Leonard is the Research Project Manager on this effort.

These are just a few of the many projects underway as a result of the UTRAC Workshop held last March. These and other projects help us to improve the way we work and better serve the public, in line with the Research Division vision, Tools for Better Transportation Tomorrow.

For more information about the status of these projects, consult the UTRAC portion of the Research Division website, or contact the Research Project Manager.

National Cooperative Highway Research Program (NCHRP)

The state departments of transportation, including Utah, are the sole sponsors of the NCHRP. Funds are drawn from the states' Federal-Aid Highway apportionment of State Planning and Research (SPR) funds. The funds can be spent only for the administration of problems approved on ballot by at least two-thirds of the states. Each state's allocation amounts to 5-1/2% of its SPR funding.



Each year in early July, the AASHTO Standing Committee on Research (SCOR) solicits problems from four authorized sources: (1) the chief administrative officers of the member highway and transportation departments, (2) the chairs of AASHTO's committees and subcommittees, (3) AASHTO's Board of Directors, and (4) the Federal Highway Administrator. Problem statements are due September 15 of the same year. The new problem candidates go to the SCOR and the AASHTO Research Advisory Committee (RAC) with a ballot for rating the problems according to priority. An Announcement of funded projects details the preliminary scopes of work that will be considered in requests for proposals. They can be viewed at:
http://www4.nas.edu/trb/crp.nsf/upcoming/

Technical panels are created to review the proposals, recommend contract awards, monitor research in progress, provide technical guidance, and review reports for acceptability and for accomplishment of the agency's research plan. Research findings are published in the NCHRP Reports series and the NCHRP Synthesis of Highway Practice series. In addition, to provide the earliest possible awareness and use of the research findings, NCHRP Research Results Digests and NCHRP Legal Research Digests are issued as warranted.

Full details on the program's work since inception in 1962 can be found in **NCHRP Summary of Progress Through 1988** on their web site. The NCHRP is a national transportation research program.
Five different types of publications are distributed by the NCHRP:
Publications

- NCHRP Reports
- NCHRP Syntheses of Highway Practice
- NCHRP Research Results Digests
- NCHRP Legal Research Digests
- NCHRP Web Documents

All of these reports are available at the **TRB Bookstore**.

UDOT experts are encouraged to submit problem statements to the NCHRP for consideration. Each year the Research Division submits problem statements to the NCHRP received from the Annual UTRAC Workshop. UDOT issues with national significance and large required budgets tend to be good candidates for NCHRP.

Upcoming Events

A team of UDOT specialists will attend the TRB 85th Annual Meeting January 22–26, 2006. Each expert will concentrate on different aspects of our business, and bring back at least two initiatives for implementation in Utah. If you have a pressing issue that you would like one of these experts to investigate at a TRB session, contact the Research Division and we will facilitate the needed technology transfer.

The sessions scheduled at the TRB Annual Meeting can be viewed at www.trb.org/meeting/

The TRB Annual Meeting will attract approximately 9,000 transportation professionals from around the world to Washington, D.C. The TRB Annual Meeting program covers all transportation modes, with more than 2,600 presentations in 500 sessions addressing topics of interest to all attendees—policy makers, administrators, practitioners, researchers, and representatives of government, industry, and academic institutions. This year's spotlight theme is "*Transportation 2025: Getting There from Here*". Also highlighted will be "*The Interstate Highway Systems 50th Anniversary - What Have We Learned?*", and "*SAFETEA-LU: What it Means for Research and the Transportation Community*".

The Transportation Research Board (TRB) is a division of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board—one of six major divisions of the National Research Council—is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation.

TRB fulfills this mission through the work of its standing committees and task forces addressing all modes and aspects of transportation; publication and dissemination of reports and peer-reviewed technical papers on research findings; management of

cooperative research and other research programs; conduct of special studies on transportation policy issues at the request of the U.S. Congress and government agencies; operation of an on-line computerized file of transportation research information; and the hosting of an annual meeting.

Some of the more useful TRB resources are:

- The **Transportation Research Information Services** (TRIS) Database is the world's largest and most comprehensive bibliographic resource on transportation information. TRIS is produced and maintained by the Transportation Research Board at the National Academy of Sciences.
- The **Research In Progress** (RiP) Database contains about 6,600 records of current or recently completed transportation research projects.

2006 Annual UTRAC Workshop

Plans are underway for the 2006 UTRAC workshop in mid-March. Now is the time to begin developing problem statements to address the most pressing needs in your part of UDOT. Advance submission of problem statements will again be required. Keep an eye out for more information in the next few weeks. Contact Blaine Leonard bleonard@utah.gov for more information.

Construction/Maintenance

Type III Micro Surfacing Used As a Life Extender of Old Concrete Pavement on I-70 in Region Four

Region Four Operations has been diamond grinding major portions of I-70 concrete to improve the ride. The eastbound outside lane of I-70 at the east abutment of the Shingle Creek Structure, MM 10 +/- exhibited severe transverse cracking and degradation in general.

Region Four Operations solicited Intermountain Slurry Seal Inc., located in Salt Lake City, to provide a process to extend the life of this 1,500 LF of concrete pavement, outside lane only on the east bound portion of I-70 at a cost of $2.00 per square yard plus for one coat application.

Intermountain Slurry Seal Inc. proposed a double application of micro surfacing for the first 880 feet then a single application of micro surfacing for the next 620 feet. This type of pavement preservation or life extender of existing deteriorated concrete pavement has, as far is known, never been applied in Utah. The Utah Department of Transportation Research Division,

Ken Berg and Barry Sharp, were present when the micro surfacing was applied on October 24, 2005. The installation of the first lift of micro surfacing went without a hitch but the weather prevented the second lift from being trouble free. There were about three noticeable stop/start cosmetic flaws but none that will affect the function of this application.

The application of this process began with 0.12 gallons per square yard of tack coat, CQS-lHP/1% polymer, then the first lift of micro surfacing, CPC total crushed aggregate, ¼" minus and SIM Emulsion at 13% by weight with a 3% polymer to about 3/8" thick application, then the second application was the same.

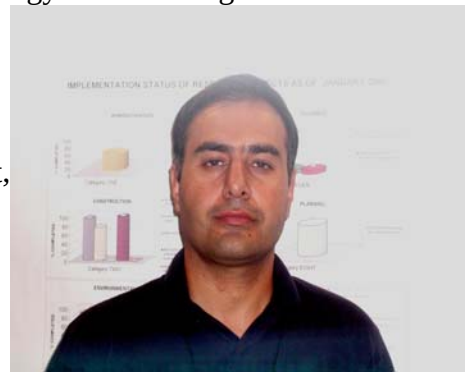
This micro surfacing application allowed traffic within 4 hours and the surface was an even texture while the harsh aggregate furnished a very high skid number at the finished surface.

The UDOT Research Development section will treat this application as an experimental feature, and prepare a work plan for a two-year evaluation. Interim reports will be written and placed on the Research Web Page. For more information, please contract Barry Sharp rsharp@utah.gov .

In the Know

A Look At Who We Are

An ongoing feature of our quarterly newsletter is an introduction to one of our Research and Development Division staff member. In this edition, we will introduce to you Abdul Wakil. Abdul has been with UDOT for a little over seven years and three of that in Research and Development. He is the current Technology Transfer Engineer. Abdul' s major responsibilities include providing literature/document searches, preparing white papers, supervising the Lester Wire Library, managing the Local Technical Assistance Program (LTAP), managing the Good Roads Cost Less research project, coordinating monthly Washto-X videoconferencing and library Technology Transfer Sessions, preparing quarterly research newsletters, helping with implementation of new and successful technologies from the FHWA Market Ready Technologies, dissemination of information/publications and electronic news, etc. Abdul is always willing to help and answer your questions about technology transfer. If you are in need of any information or willing to provide a technology transfer session in the library, please contact Abdul at awakil@utah.gov



Completed UDOT Research Studies

Research publications are our valuable resources. For a list of recently completed Research Projects, please visit the Research & Development website at: http://www2.udot.utah.gov/index.php?m=c&tid=235 . To obtain a printed copy, please contact awakil@utah.gov

Need a Literature Search?

The UDOT Research Division and Lester Wire Library provide an important service through literature searches. The service is free to customers and taps into national transportation databases. These searches help identify published information about your topic of interest. To request a search, provide a brief description and some key words on this FORM and submit it to awakil@utah.gov. or online at http://www.udot.utah.gov/index.php/m=c/tid=895/ The following are some of the key databases we use in our searches.

National Transportation Library

TRIS Online v2.7 Search Entry

TRB Transportation Research Board

Please send comments and questions about this newsletter to Abdul Wakil awakil@utah.gov